TX-840

SERIAL No. 3331

ONKYO SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODELS TX-840/TX-840M

Black model

BHUD, BHUDN, MBHUDN	120V AC, 60Hz
BHUG	220V AC, 50Hz
BHUW	120/220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power output:	60 watts per channel, min, RMS, at 8ohms, both channels driven,from 20Hz to 20kHz, with no more than 0.08% total harmonic distortion.	
Musical Power Output:	2 × 160 watts at 4 ohms, 1kHz (DIN)	
	2 × 100 watts at 8 ohms, 1kHz (DIN)	
Continuous Power Output:	2 × 90 watts at 4 ohms, 1kHz (DIN)	
	2 × 70 watts at 8 ohms, 1kHz (DIN)	
Total Harmonic Distortion:	0.08% at rated power	
	0.08% at 1 watts output	
IM Distortion:	0.08% at rated power	
	0.08% at 1 watts output	
Damping Factor:	40 at 8 ohms	
Frequency Response:	20-30,000Hz ±1dB	
RIAA Diviation:	20-20,000Hz ±0.8dB	
Sensitivity and Impedance:	Phono:	2.5mV/50 kohms
	CD:	150mV/50 kohms
	Tape Play:	150mV/50 kohms
	Tape Rec:	150mV/3.5 kohms
Phono Overload(MM):	120mV RMS at 1kHz, 0.08% THD.	
Signal-to-Noise Ratio:	Phono:	85dB(at 10mV input, A weighted)
		75dB(IHF A-202)
	CD/Tape:	95dB(A weighted)
		80dB(IHF A-202)
Tone controls:	Bass:	±10dB at 100Hz
	Treble:	±10dB at 10kHz

TUNER SECTION

FM:	**-220V/ Worldwide models-**		**-120V model-**	
Tuning Range:	87.50-108.00MHz(50kHz steps)		87.9-107.9kHz(200kHz steps)	
	87.50-108.00MHz(50kHz steps) or			
	87.9-107.9kHz(200kHz steps) (Worldwide model)			
Usable Sensitivity:	Mono:	12.8dBf,1.2 μV,75ohms	Mono:	11.2dBf,2.0 μV
		1.0 μV(S/N 26dB,40kHz Devi.)		
		75ohms DIN		
	Stereo:	18.0dBf,2.2 μV,75ohms	Stereo:	17.2dBf,4.0 μV
		23μV(S/N 46dB,40kHz Devi.)		
		75ohms DIN		
50dB Quieting Sensitivity:	Mono:	18.0dBf,2.2 μV,75ohms	Mono:	17.2dBf,4.0 μV
	Stereo:	37.2dBf,20μV,75ohms	Stereo:	37.2dBf,40μV
Capture Ratio:	1.5dB		1.5dB	
Image Rejection Ratio:	85dB		40dB	
IF Rejection Ratio:	90dB		90dB	
Signal-to-Noise Ratio:	Mono:	72dB	Mono:	72dB
	Stereo:	66dB	Stereo:	66dB
Alternate Channel Attenuation:			55dB	
Selectivity:	50dB DIN(±300kHz,40kHz dev.)			
AM suppression Ratio:	50dB		50dB	
Harmonic Distortion:	Mono:	0.15%	Mono:	0.15%
	Stereo:	0.30%	Stereo:	0.30%
Frequency Response:	30-15,000Hz ±1.5dB		30-15,000Hz ±1.5dB	
Stereo Separation:	45dB at 1kHz		45dB at 1kHz	
	30dB at 100-10,000Hz		30dB at 100-10,000Hz	
Muting Level:	17.2dBf, 4.0μV		17.2dBf, 4.0μV	
AM:				
Tuning Range:	522-1611kHz(9kHz steps)		530-1620kHz(10kHz steps)	
	522-1611kHz(9kHz steps) or			
	530-1620kHz(10kHz steps) (Worldwide model)			
Usable Sensitivity:	30μV		30μV	
Image Rejection Ratio:	40dB		40dB	
IF Rejection Ratio:	40dB		40dB	
Signal-to-Noise Ratio:	40dB		40dB	
Harmonic Distortion:	0.7%		0.7%	

GENERAL

Dimensions(W×H ×D):	435 ×130 ×351mm
	17-1/8" ×5-1/8 " ×13-13/16"
Weight:	8.2kg., 18.1lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

D (120V) model

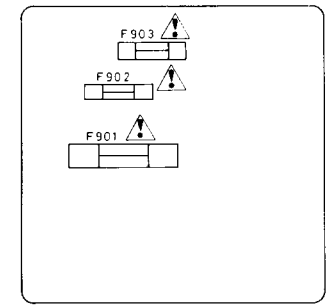
Circuit no.	Part no.	Description
F901	252050	5A (ST-6), Primary

G (220V) model

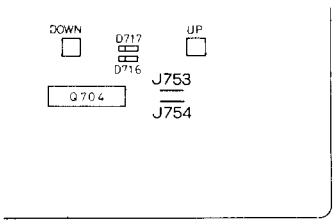
Circuit no.	Part no.	Description
F902	252075	2.5A-SE-EAK, Primary
F903	252075	2.5A-SE-EAK, AC outlet

W (Worldwide) model

Circuit no.	Part no.	Description
F901	252050	5A (ST-6), Primary
F902	252075	2.5A-SE-EAK, Primary



POWER SUPPLY CIRCUIT PC BOARD



DISPLAY PC BOARD

2. Change of FM/AM band step.

With the exception of the models below, a BAND STEP selector switch is not provided.

(FM)

MODEL	BAND STEP	D717, J753	R119
UD	200kHz→50kHz	Additional	15kΩ→24kΩ
UG/UQ	50kHz→200kHz	Eliminated	24kΩ→15kΩ

(AM)

BAND STEP	D716, J754
10kHz→ 9kHz	Additional
9kHz→10kHz	Eliminated

In D716/7 1SS133 (Part No. 223163) is used. In J753/4, a jumper lead must be inserted. R119, with the muting amplitude determined is on the back panel side of FM/AM tuner and selector circuit printed circuit board assembly test points TP-1 and TP-2.

– Worldwide model –

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 200kHz and 10kHz depending on the area where the unit is used.

	De-emphasis	FM step	AM step
Europe:	50 μsec	50kHz	9kHz
U.S.A.:	75 μsec	200kHz	10kHz

3. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

4. Safety-check out

(Only U.S.A. model)

After correcting the original service problem perform the following safety check before releasing the set to the customer.

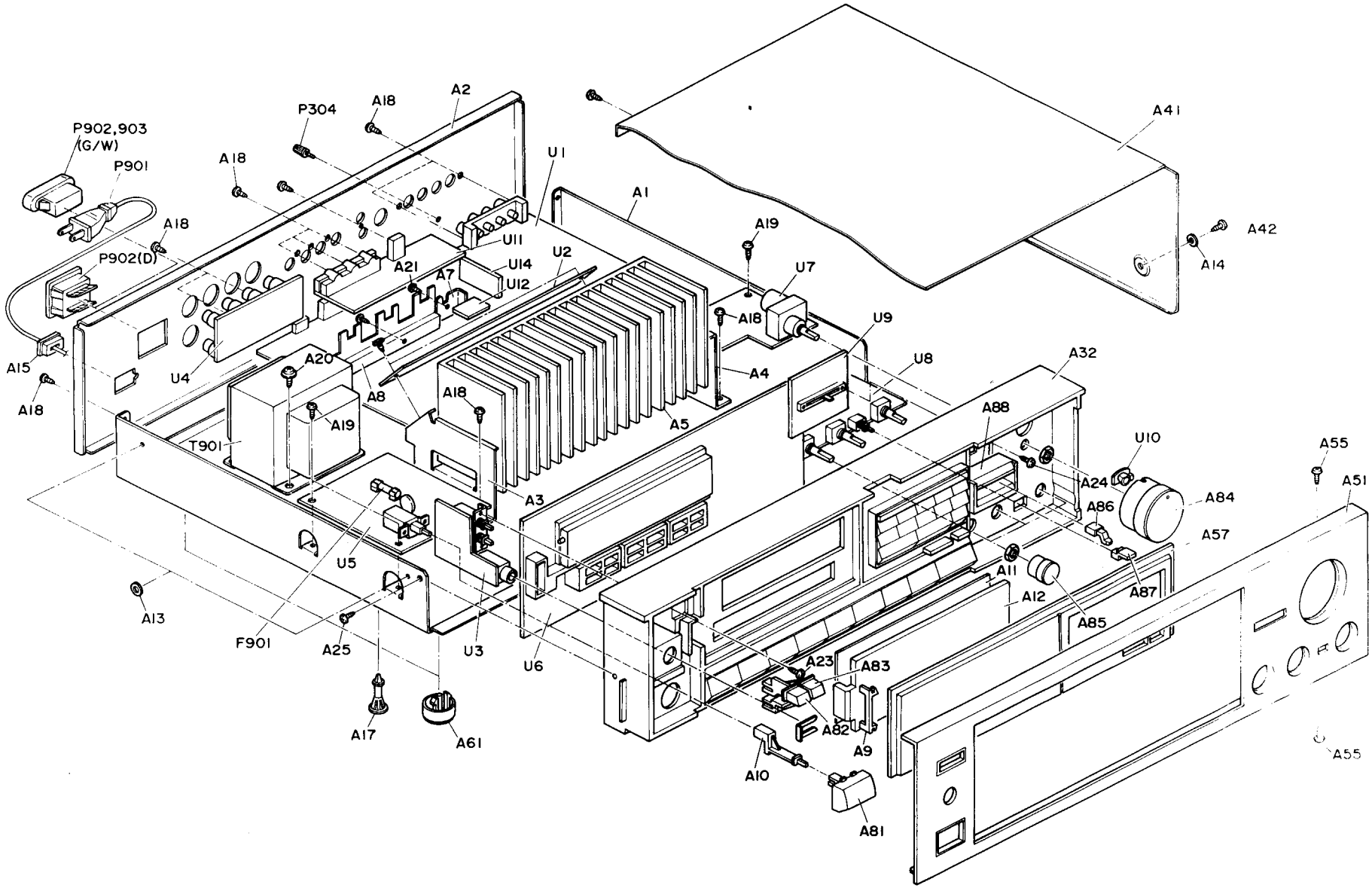
Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel. Specifications: 3.3 Mohm ±10% at 500V.

5. Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screw-driver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

EXPLODED VIEW



PARTS LIST

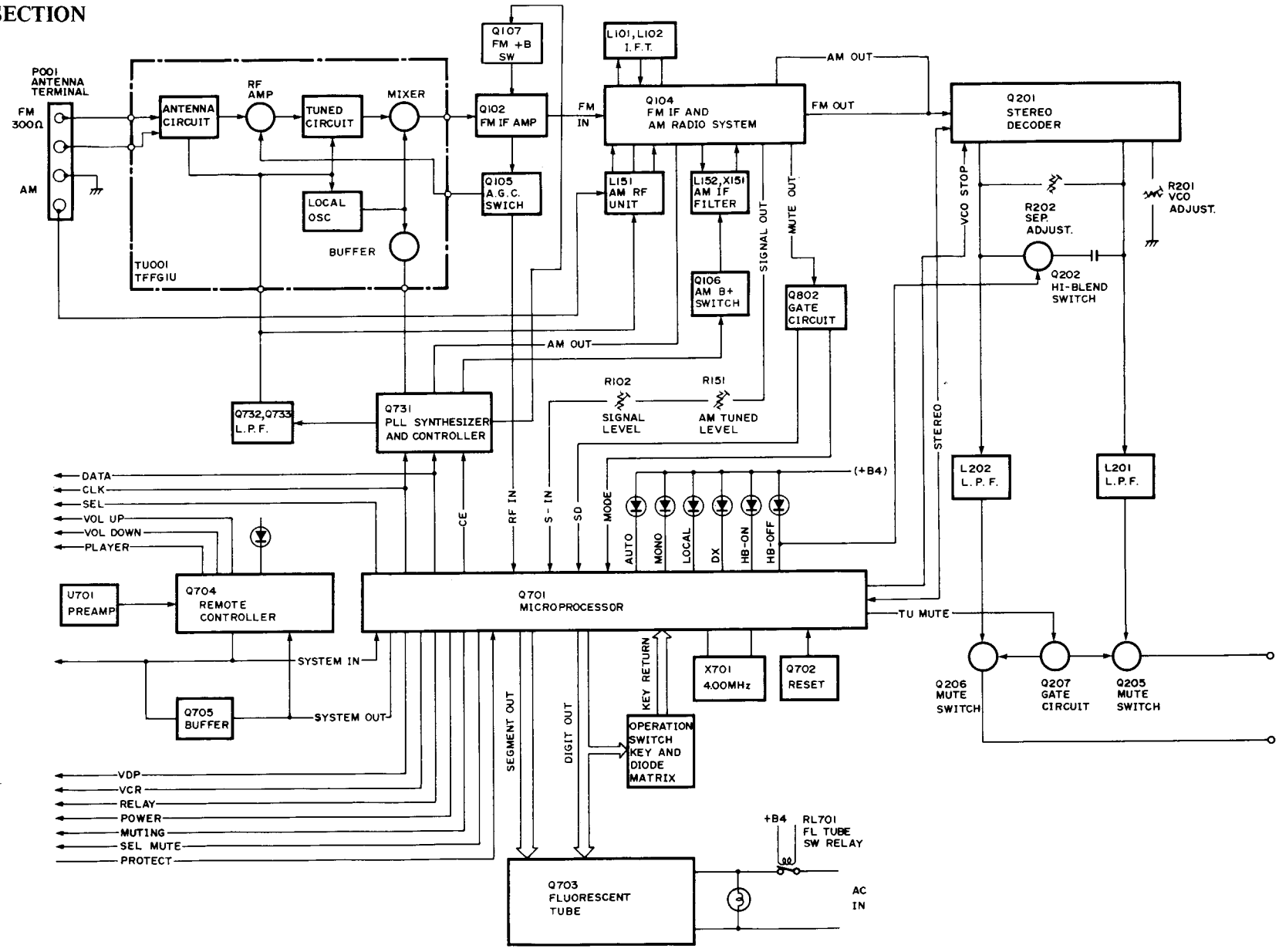
REF. NO.	PART NO.	DESCRIPTION
A1	27100163-1	Chassis
A2	27121254	Back panel <D>
	27121254-1	Back panel <G>
	27121254-2	Back panel <W>
A3	27141261A	Bracket LH
A4	27141262	Bracket RH
A5	27160226A	Radiator
A7	27141263	Bracket SH
A8	27141264	Bracket H
A9	27190644	Holder,dial plate
A10	27273098B	Joint,power
A11	28133225	Back plate
A12	28130256	Dial plate
A13	27270147	Spacer <G/W>
A14	870048	3 ×8 ×0.8t,Nylon washer <G/W>
A15	27300750	⚠Strainrelief
A17	27190524	Holder
A18	834430088	3TTS+8B(BC),Tapping screw
A19	831130088	3TTW+8B,Tapping screw
A20	830440089	4TTC+8C(BC),Tapping screw
A21	834430108	3TTS+10B(BC),Tapping screw
A23	82143006	3P+6FN(BC),Pan head screw
A24	82142004	2P+4F(BC),Pan head screw
A25	833430080	3TTP+8P(BC),Pan head screw
A32	27110491A	Front bracket ass'y
A41	28184394	Top cover
A42	834430088	3TTS+8B(BC),Tapping screw
A51	1A158121	Front panel ass'y
A55	833430080	3TTP+8P(BC),Tapping screw
A57	28191466-1A	Clear plate
A61	27175221A	Leg
A81	28323241-1A	Knob POWER
A82	28323361	Knob SPEAKER A
A83	28323363	Knob SPEAKER B
A84	28323365B	Knob VOLUME
A85	28323310	Knob TONE
A86	28322925	Knob SLIDE
A87	28323367	Knob PUSH
A88	27190647	Holder SLIDE
F901	252050	⚠5A(ST-6),Primary fuse <D/W>
F902	252075	⚠2.5A-SE-EAK,Primary fuse <G/W>
F903	252075	⚠2.5A-SE-EAK,AC outlet fuse <G>
P304	25060044	14×3mm,Terminal GROUND
P901	253123, 253136, 253140 or 253146	⚠AS-UC-6 #18,Power supply cord <D>
P901	253148 or 253150	⚠AS-CEE,Power supply cord <G/W>
P902	25050341	⚠NSCT-4P168T,AC outlet <D>
P902,P903	25050337	⚠NSCT-2P164,AC outlet <G/W>
Q521,Q522	2501703, 2501704 or 2501706	2SC3855(O), 2SC3855(Y) or 2SC3855(P),Power amplifier transistor
Q523,Q524	2501693, 2501694 or 2501696	2SA1491(O), 2SA1491(Y) or 2SA1491(P),Power amplifier transistor
S903	25065123	⚠NSS-1258P,Voltage selector switch <W>
T901	2300306	⚠NPT-993D, Power transformer <D>
	2300307	⚠NPT-993G,Power transformer <G>
	2300308	⚠NPT-993DG,Power transformer <W>
U1	1A158576-4	NAAR-3276-4, FM/AM tuner and selector circuit pc board ass'y <D>
	1A158576-4A	NAAR-3276-4A,FM/AM tuner and selector circuit pc board ass'y <G>
	1A158576-4B	NAAR-3276-4B,FM/AM tuner and selector circuit pc board ass'y <W>
U2	1A158577-4	NAAF-3277-4, Power amplifier pc board ass'y
U3	1A158578-4	NASW-3278-4, Speaker switch pc board ass'y <D/W>
	1A158578-4A	NASW-3278-4A,Speaker switch pc board ass'y <G>
U4	1A158579-4	NAETC-3279-4, Speaker terminal pc board ass'y <D>
	1A158579-4A	NAETC-3279-4A,Speaker terminal pc board ass'y <G/W>
U5	1A158580-4	NAETC-3280-4, Const. voltage circuit pc board ass'y
U6	1A158581-4	NADIS-3281-4, Display pc board ass'y <D>
	1A158581-4A	NADIS-3281-4A,Display pc board ass'y <G>
	1A158581-4B	NADIS-3281-4B,Display pc board ass'y <W>
U7	1A158582-4	NAAF-3282-4, Volume pc board ass'y <D>
	1A156574-1	NAAF-3574-1, Volume pc board ass'y <G/W>
U8	1A158583-4	NAAF-3283-4, Preamplifier pc board ass'y <D>
	1A158583-4A	NAAF-3283-4A,Preamplifier pc board ass'y <G/W>
U9	1A158584-4	NAAF-3284-4, Switch pc board ass'y
U10	1A158585-4	NADIS-3285-4, Volume indicator pc board ass'y <D>
	1A156575-1	NADIS-3575-1, Volume indicator pc board ass'y <G/W>
U11	1A158586-4	NAETC-3286-4, Video terminal pc board ass'y <D>
	1A158586-4A	NAETC-3286-4A,Video terminal pc board ass'y <G/W>
U12	1A158587-4	NAPS-3287-4, Power supply circuit pc board ass'y <D>
	1A158587-4A	NAPS-3287-4A,Power supply circuit pc board ass'y <G>
	1A158587-4B	NAPS-3287-4B,Power supply circuit pc board ass'y <W>
U14	1A073554-2	NAAF-3054-2, Equalizer amplifier pc board ass'y <D>
	1A086554-3	NAAF-3054-3, Equalizer amplifier pc board ass'y <G/W>

NOTE: <D >: Only 120V model
<G >: Only 220V model
<W >: Only Worldwide model

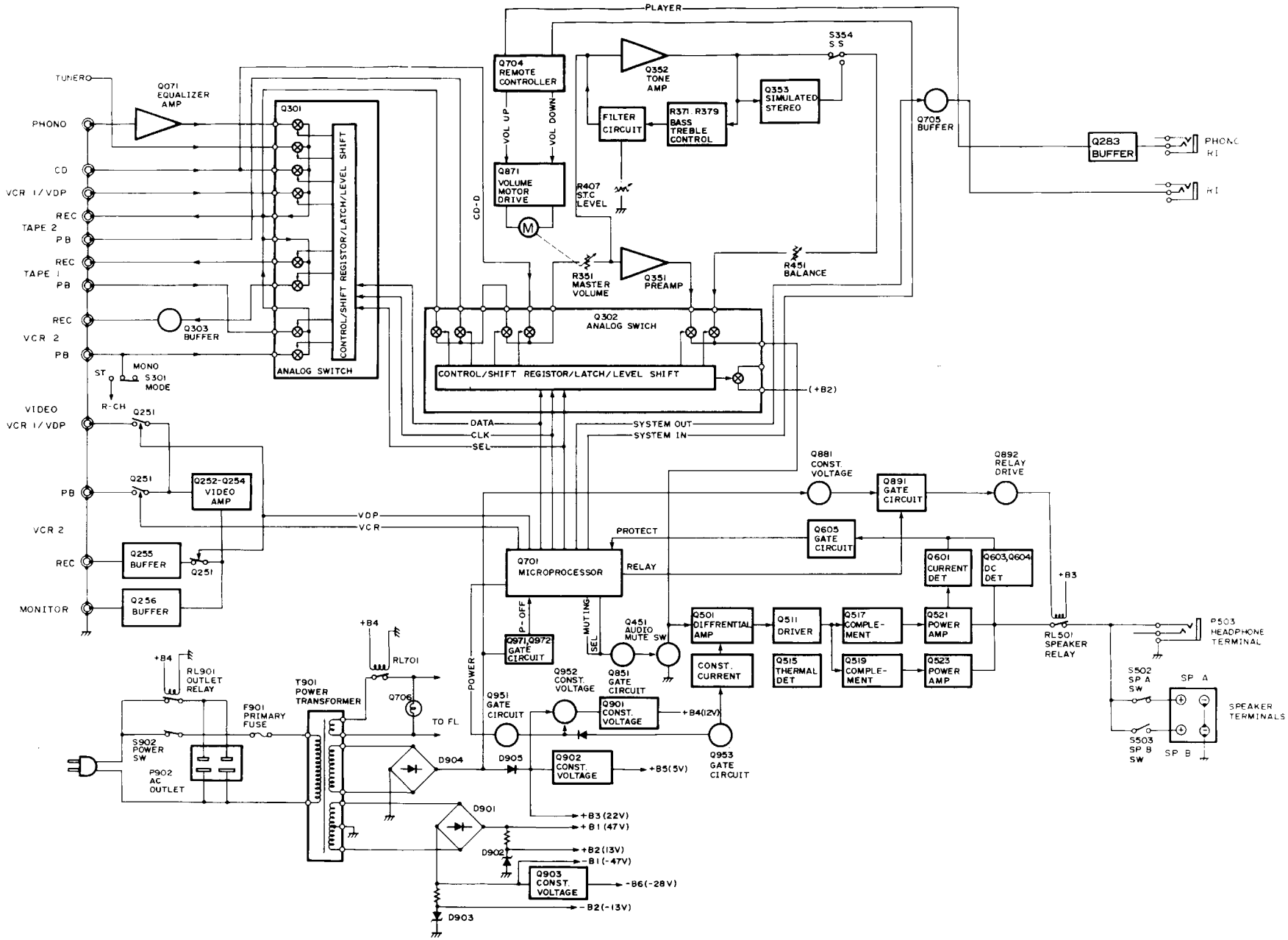
NOTE: THE COMPONENTS IDENTIFIED BY MARK⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

BLOCK DIAGRAM

–120V MODEL–
TUNER SECTION



AMPLIFIER SECTION



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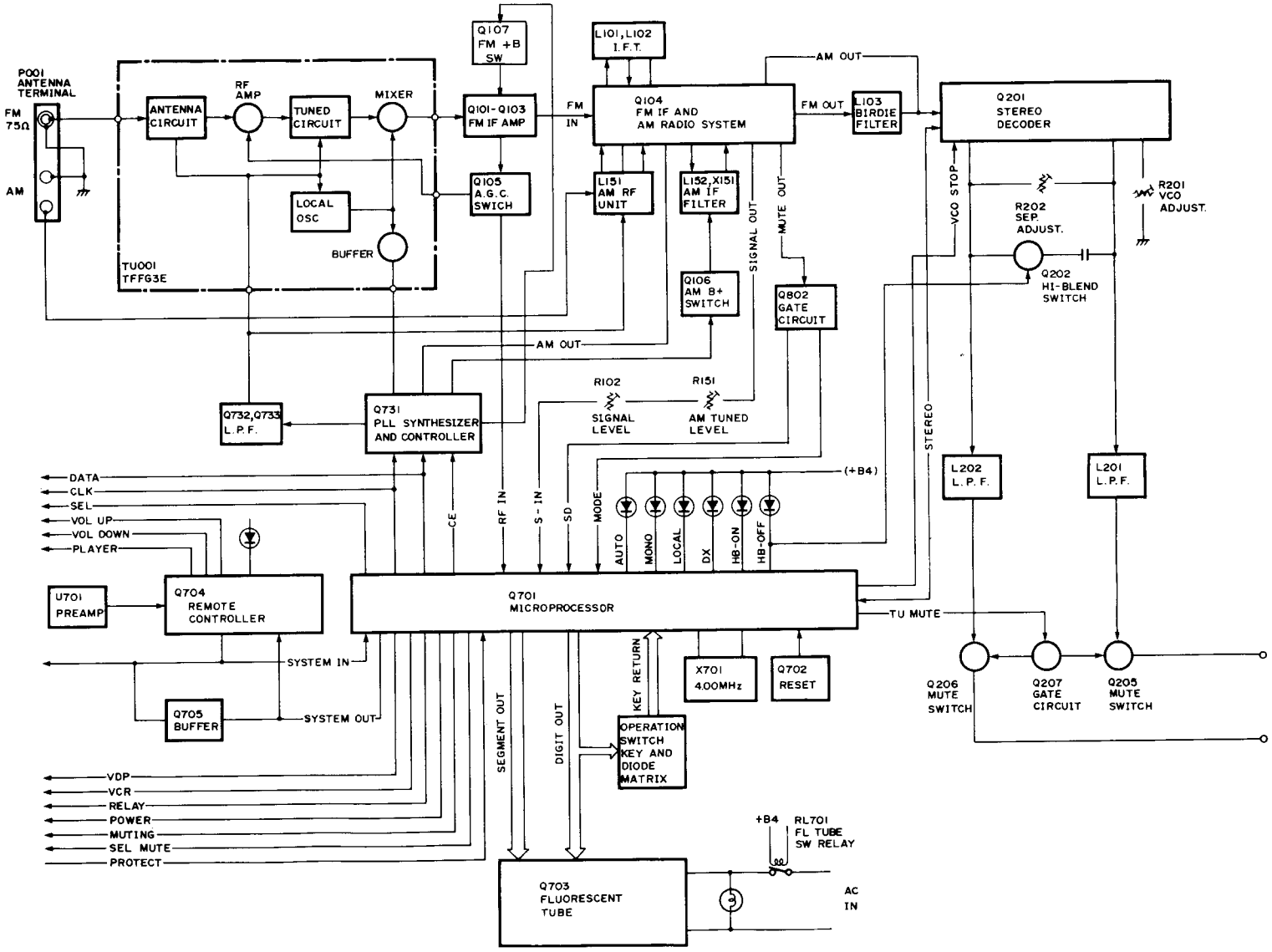
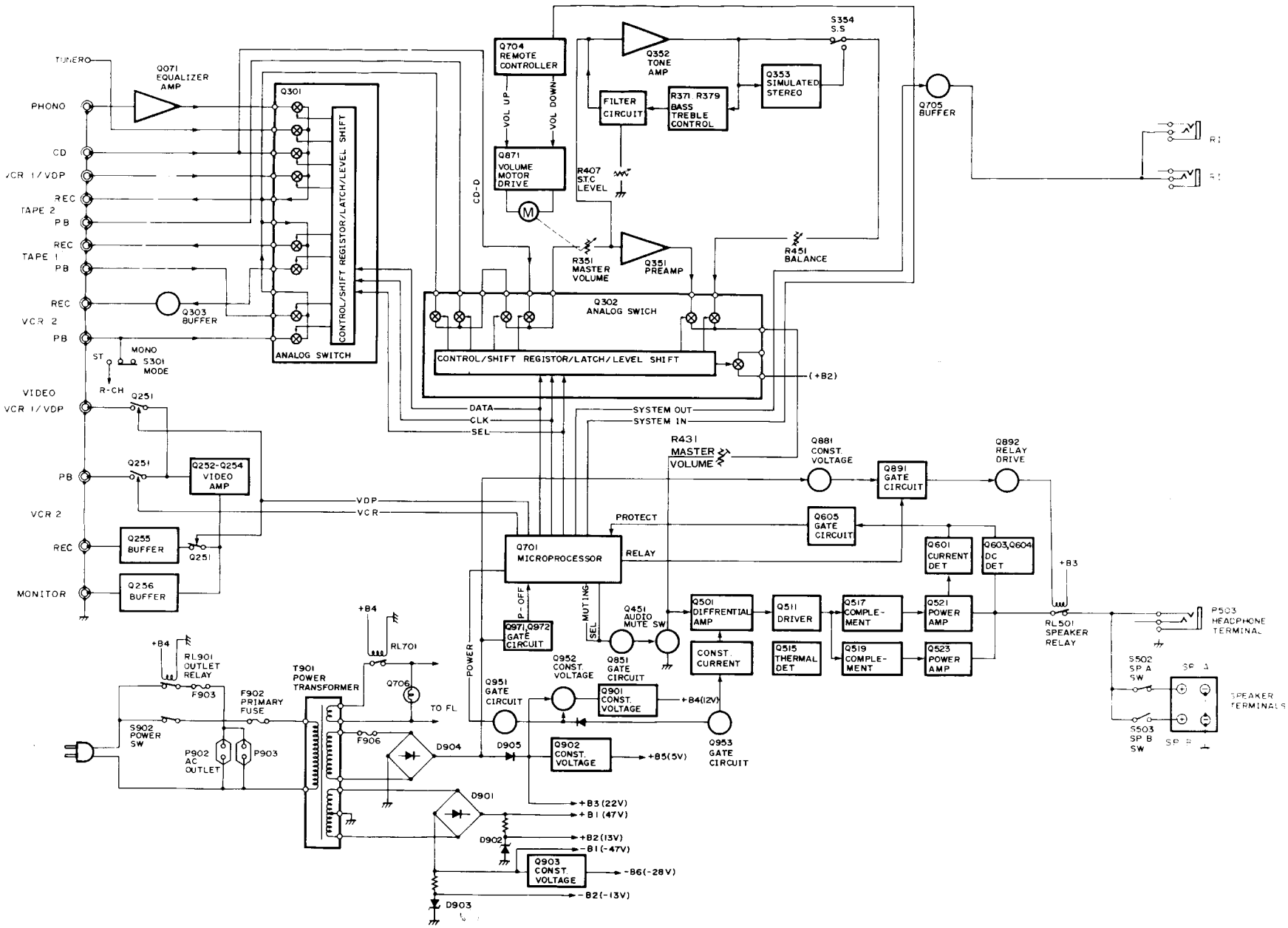
BLOCK DIAGRAM

–OTHER MODELS–
TUNER SECTION



AMPLIFIER SECTION



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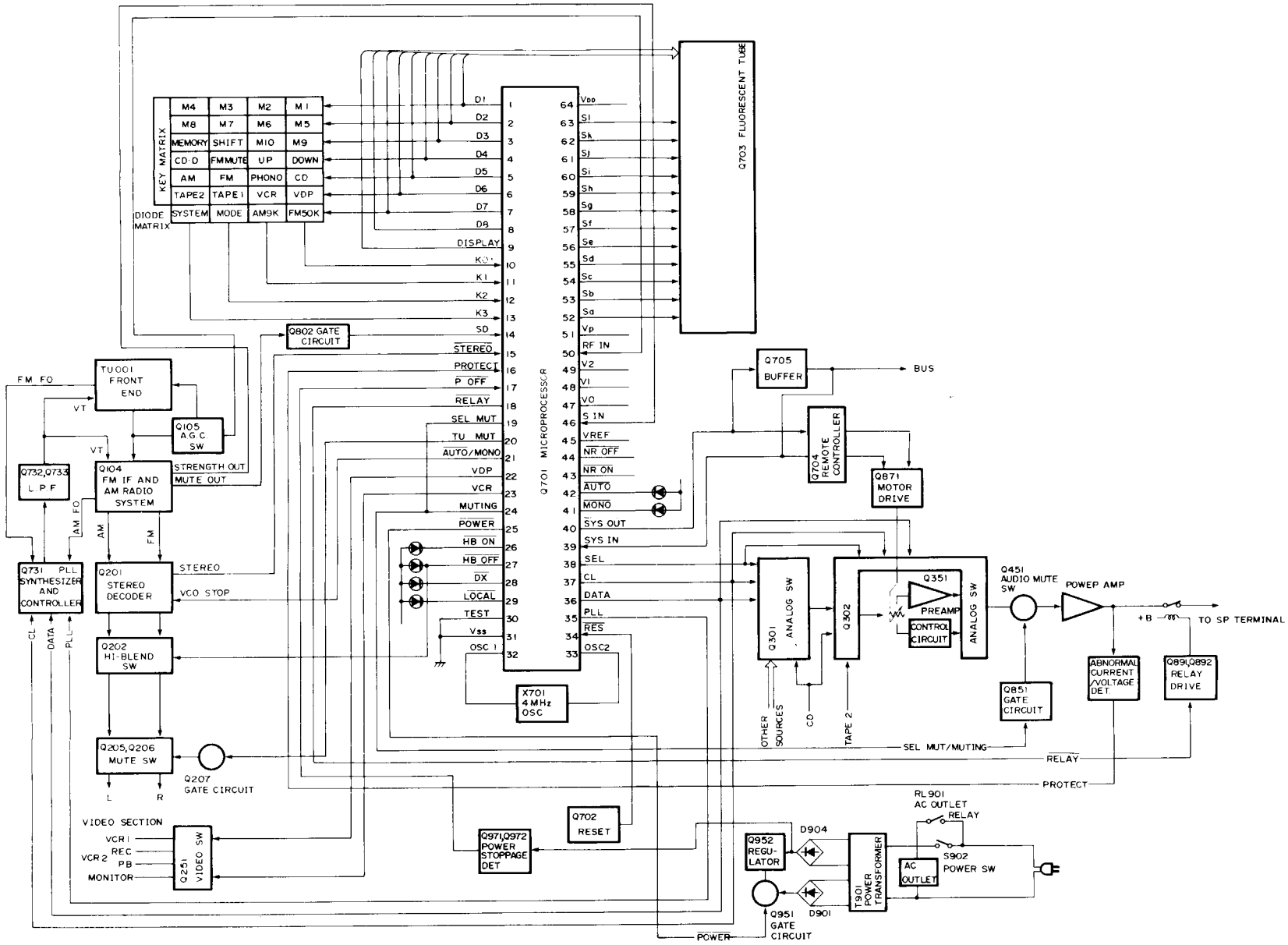
CONNECTION VIEW OF MICROPROCESSOR



BLOCK DIAGRAM OF ICS

LC6568H-3643 (MICROPROCESSOR)

Terminal Descriptions

Pin No.	Terminal	Description
1 2 3 4 5 6 7 8	D1 D2 D3 D4 D5 D6 D7 D8	These are the digit and key scan signal terminals. "H" when active.
9	DISPLAY	Display output terminal."H" when active.
10 11 12 13	K0 K1 K2 K3	These are the input terminal for key return signal source and diode matrix."H" when active.
14	SD	Auto stop signal input terminal.Auto tuning stops when this terminal becomes the high level.
15	$\overline{\text{STEREO}}$	This is the input terminal for detection of the stereo broadcast."L" when active.
16	PROTECT	This is the detection terminal for protection circuit.The speaker relay turns off when this terminal becomes the high level.
17	$\overline{\text{POWER OFF}}$	This is the input terminal for detection of the stoppage of electric current."L" when the stoppage of electric current.
18	$\overline{\text{RELAY}}$	This is the output terminal for control of the speaker relay."L" when active.
19	SEL MUTE	This is the muting output terminal when the selector key is operated."H" when active.
20	TU MUTE	This is the output terminal for muting control of tuner section."L" when active.
21	$\overline{\text{AUTO}}$/MONO	This is the AUTO/MONO switching output terminal. "L" when AUTO.
22 23	VDP VCR	These are the output terminal for control of video signal.
24	MUTING	This is the output terminal for muting control. "H" when active.
25	POWER	This is the output terminal for power source.It is "H" for power on.
26	$\overline{\text{HB ON}}$	This is the output terminal for indication of HI-BLEND ON. "L" when active.
27	$\overline{\text{HB OFF}}$	This is the output terminal for indication of HI-BLEND OFF. "L" when active.
28	$\overline{\text{DX}}$	This is the output terminal for indication of DX. "L" when active.
29	$\overline{\text{LOCAL}}$	This is the output terminal for indication of LOCAL. "L" when active.
30	TEST	Test terminal.Connect to the ground.
31	Vss	Ground terminal.
32 33	OSC1 OSC2	Connect to the 4.00MHz ceramic oscillator.
34	$\overline{\text{RES}}$	This is the input terminal for reset. "L" when active
35	PLL	Connect to the terminal CE of PLL IC(LM7001).
36	DATA	This is the serial data output terminal.Connect to the terminal DATA of PLL IC and terminal DI of analog switches. (LC7821/LC7823)
37	CLOCK	This is the serial clock output terminal.Connect to the terminal CI of PLL IC and terminal CL of analog switches.
38	SEL	Connect to terminal SEL of analog switch(LC7821).
39	SYSTEM IN	This is the input terminal for system code. "H" when active.
40	$\overline{\text{SYSTEM OUT}}$	This is the input terminal for system code. "L" when active.
41	$\overline{\text{MONO}}$	This is the output terminal for indication of MONO. "L" when active.
42	$\overline{\text{AUTO}}$	This is the output terminal for indication of AUTO. "L" when active.
43	$\overline{\text{NR ON}}$	This is the output terminal for indication of NR ON. "L" when active.
44	$\overline{\text{NR OFF}}$	This is the output terminal for indication of NR OFF. "L" when active.
45	VREF	This is the input terminal for comparator reference voltage.
46	S IN	This is the signal strength input terminal.
47	V0	This is the output terminal for comparator reference voltage.
48	V1	This is the output terminal for comparator reference voltage.
49	V2	This is the output terminal for comparator reference voltage.
50	RF IN	This is the input terminal for control of AGC. "H" when active.
51	VP	Pull-down resistor connection terminal of FIP controller/driver.

Pin No.	Terminal	Description
52	Sa	These are the output terminal for segment signal. "H" when active.
53	Sb	
54	Sc	
55	Sd	
56	Se	
57	Sf	
58	Sg	
59	Sh	
60	Si	
61	Sj	
62	Sk	
63	Sl	
64	VDD	This is the divice power source terminal.At the time of operation,the supply is 5V.The internal data memory(RAM) is maintained by means of the super capacitor.

FM50K (FM band setting)

FM50K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europer	87.50 ~108.00MHz	50kHz	25kHz	10.7MHz
0	U.S.A.	87.9 ~107.9MHz	200kHz	25kHz	10.7MHz

ADJUSTMENT PROCEDURES

Preparation

- **Input**

FM mono: 1kHz, 75kHz devi., 60dB/μV
FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz 7.5kHz devi.
AM: 400Hz, 30% mod.,

- **Output**

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

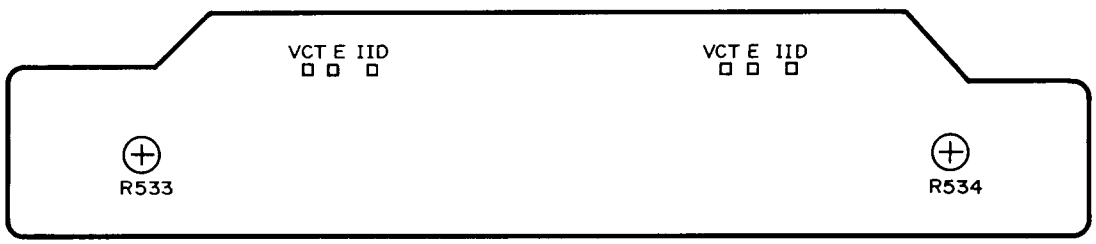
- **Standard knob position**

TAPE MONITOR . . . . . SOURCE
VOLUME . . . . . Maximum
BASS/TREBLE/BALANCE . . . . . Center
VCR 2 MODE. . . . . STEREO
SPEAKER . . . . . A
SIMULATED STEREO . . . . . OFF

Amplifier section

1. Idling current adjustment

Connect the DC voltmeter to the terminals I ID and V CT on the power amplifier pc board.
Adjust the semi-fixed resistors R533 and R534 so that the indication of voltmeter is 7.5 ± 1.5mV.
Notes: VOLUME . . . . . Maximum, Open load,
Adjust after switching on for 5 minutes.



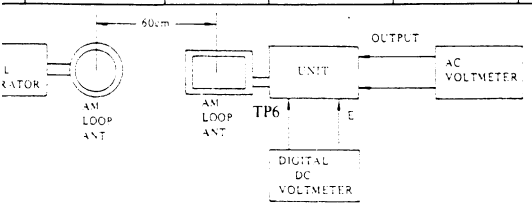
Power amplifier pc board

section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM IF	1	Fig. 1	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)	–	99.1MHz	DC voltmeter	L101	0V ± 20mV	Mode switch: MONO Repeat the steps 1 and 3 until no further adjustment is necessary
	2					AC voltmeter	IF on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
Stereo ator level	1	Fig. 3	99.1MHz 17.2dBf (12dB) Ext. modulation	L + R : 1kHz 67.5kHz devi.	99.1MHz	Stereo indicator	R101	Light on	Mode switch: STEREO
	2		99.1MHz 16.2dBf (11dB) Ext. modulation	Pilot signal 19kHz 7.5kHz devi.				Light off	
VCO		Fig. 2	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)		99.1MHz	Frequency counter	R201	19kHz ± 10Hz	
Stereo stortion		Fig. 3	99.1MHz 65dBf (60dB) Ext. modulation	L or Rch. 1kHz	99.1MHz	Distortion analyzer	IF on the front end	Minimum	Don't turn more than ± 180°.
Stereo paration	1	Fig. 3	99.1MHz 65dBf (60dB) Ext. modulation	Lch. 1kHz	99.1MHz	Rch. AC voltmeter	R202	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	
lend level		Fig. 3	99.1MHz 35.2dBf (30dB) 1kHz, 75kHz devi.	–	99.1MHz	Hi-blend indicator	R102	Light off	

section

p	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for
		530kHz [522kHz] (531kHz)	Digital DC voltmeter	OSC on RF block	1.3V ± 0.1V
	600kHz(603kHz) 400Hz 30% mod. 60dB/m	600kHz (603kHz)	AC voltmeter	RF on RF block	Maximum
	1000kHz (999kHz) 400Hz 30% mod. 60dB/m	1000kHz (999kHz)	AC voltmeter	L152	Maximum
	Same as above	1000kHz (999kHz)	First signal indicator	R151	Light on



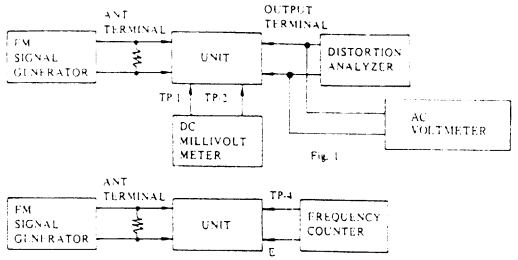
[ ] : 10kHz step model
( ) : W model
( ) : 9kHz step model

Reference specifications

FM Tuned voltage
87.9MHz 2.0 ± 0.5V
107.9MHz 7.7 ± 0.5V
(120V model)
87.5MHz 2.0 ± 0.5V
108.0MHz 7.7 ± 0.5V
(Other models)

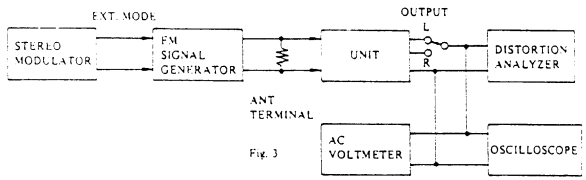
Auto stop level AM: Less than 66dB/m
FM: Less than 17dBμ

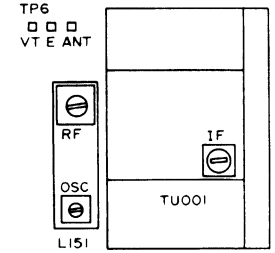
AM Tuned voltage
530kHz 1.3 ± 0.5V
1620kHz 8.0 ± 0.5V
(120V model)
522kHz 1.3 ± 0.5V
1611kHz 8.0 ± 0.5V
(Other models)

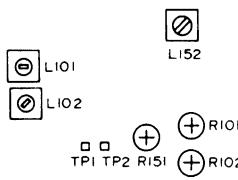


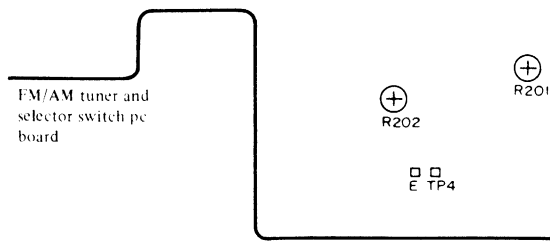
Use the high impedance probe. (10 : 1)

Fig. 2









DISPLAY PC BOARD

PRINTED CIRCUIT BOARD-PARTS LIST

DISPLAY PC BOARD(NADIS-3281-4/4A/4B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
U701	24130001 or 24130003	GP1U501S or GP1U501XS
Q701	22240153	LC6568H-3643
Q704	22240243	LC6527C-3987
	Transistors	
Q702	2211255, 2212485 or 2210746	2SC1815(GR), JC501(Q) or 2SC945A(P)
Q705	2211455, 2212495 or 2210803	2SA1015(GR), JA101(Q) 2SA733(P)
	Fluorescent tube	
Q703	212054	7-BT-95GK
	Lamp	
Q706	210064B	6.3V,0.25A
	Diodes	
D702-D715	223163	1SS133
D716,D717	223163	1SS133 〈G/W〉
D718	224650822, 224150822 or 224450822	05AZ8.2Y or HZ8.2EB2 MTZ8.2B
D719	223163	1SS133
D720	224150562, 224450562 or 224650562	05AZ5.6Y, MTZ5.6B or HZ5.6EB2
D733-D736	223163	1SS133
	L.E.Ds	
D723,D725	225137CG,	SEL2413ECG,
D727	225137DG or 224137DY	SEL2413EDG or SEL2413EDY
D724,D726	225142	SEL2913K
D728	225142	SEL2913K
D731	225141	SEL2213C
	Osc. elements	
X701	3010099	CSA4.00MG,Ceramic
X702	3010150	CSA4.00MGW
	Capacitors	
C702	3020027 or 3000051	0.047F,5.5V or 0.047F,5.5V,Super
C704	354780109	1 μF,50V,Elect.
C707,C715	354782299	0.22μF,50V,Elect.
C708	354741009	10μF,16V,Elect.
	Resistors	
R710	49163473404	47kohm×4, 1/10W,Network
R734,R735	49163104404	100kohm ×4,1/10W,Network
	Switches	
S701-S724	25035548	NPS-111-S510
S725	25065286	NSS-22112,Band 〈W〉
	Relay	
RL701	25065298	NRL-1P1A-DC12-40
	Holder	
	27190643A	L.E.D

SPEAKER TERMINAL PC BOARD(NASW-3279-4/4A)

CIRCUIT NO.	PART NO.	DESCRIPTION
P501,P502	25060110 or 25060039	NTM-4PDMN44 or NTM-4PDMN10, Speaker terminals

PREAMPLIFIER PC BOARD(NAAF-3283-4/4A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q352	222579 or	NJM4560D or

	222570	NJM4560DX
Q353	222465 or	NJM4558D or
	222502	NJM4558DX
	Transistor	
Q851	2212600	DTA124ES
	Capacitors	
C359,C360	354780229	2.2 μF,50V,Elect.
C363,C364	354741009	10μF,16V,Elect.
C367,C368	352983396	0.33μF,50V,Non-polar elect.
C373,C374	354780229	2.2 μF,50V,Elect.
C375-C378	354781099	0.1 μF,50V,Elect.
C389	354780229	2.2 μF,50V,Elect.
C851	354780339	3.3 μF,50V,Elect.
	Resistors	
R371,R372	5104216	N14RLC50KC22Z, Variable,Bass
R379,R380	5104216	N14RLC50KC22Z, Variable,Treble
R451	5104225	N11RGLC250KW22Z, Variable,Balance
	Switch	
S354	25035590	NPS-122-L552

SPEAKER SWITCH PC BOARD(NASW-3278-4/4A)

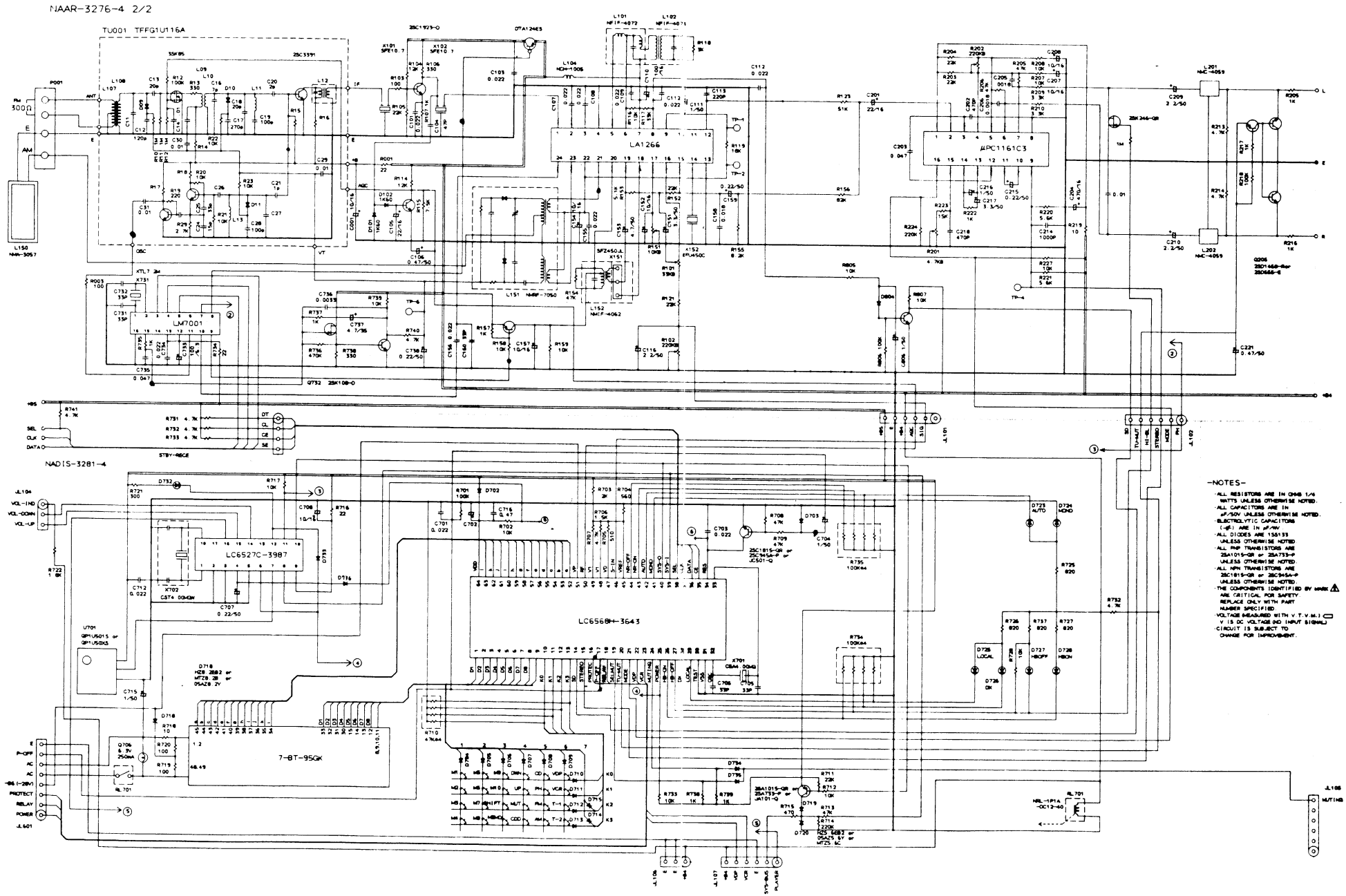
CIRCUIT NO.	PART NO.	DESCRIPTION
L501,L502	231001	S-1.3B,Coils
R549,R550	442520474	4.7ohm,1/2W,Metal oxide film resistors
R551,R552	441623914	390ohm,1W,Metal oxide film resistors
S502,S503	25035517	NPS-222-L479,Push switch
P503	25045187	HLJ-0541-01-010,Stereo headphone terminal <D/W>
	25045139	HLJ-0540-01-010,Stereo headphone terminal<G>

SPEAKER SWITCH PC BOARD

NOTE: <D>: Only 120V model
<G>: Only 220V model
<W>: Only Worldwide model

SCHEMATIC DIAGRAM

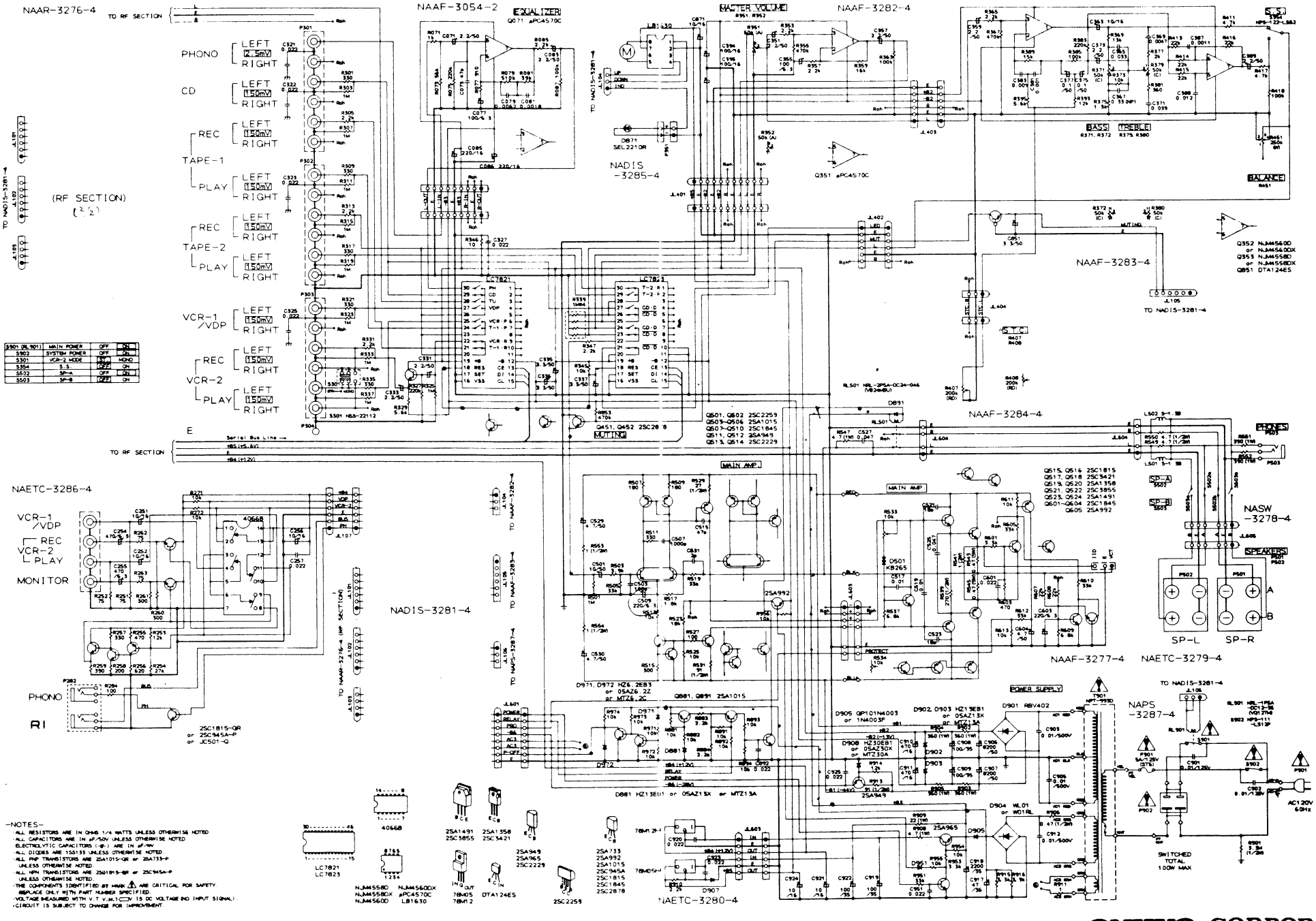
-TUNER SECTION-
-120V MODEL-



SCHEMATIC DIAGRAM

– AMPLIFIER SECTION –

– 120V MODEL –



-NOTES-

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF/50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊕) ARE IN μF/16V.
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-QR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-QR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE MEASURED WITH V.T.V.M. (⏚ IS DC VOLTAGE (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

PRINTED CIRCUIT BOARD-PARTS LIST

FM/AM TUNER AND SELECTOR CIRCUIT PC BOARD(NAAR -3276-4/4A/4B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240070	TFFG1U116A <D>
	240081	TFFG3E <G/W>
	ICs	
Q104	22240039	LA1266
Q201	222678	μPC1161C3
Q301	22240079	LC7821
Q302	22240158	LC7823
Q731	22240090	LM7001
	Transistors	
Q101	2212195	2SK241(GR) <G/W>
Q102	2211723	2SC1923(O)
Q103	2211723	2SC1923(O) <G/W>
Q105	2211255 or	2SC1815(GR) or
	2210746	2SC945A(P)
Q106,Q207	2211455	2SA1015(GR)
Q107	2212600	DTA124ES
Q202	2211945	2SK246(GR)
Q205,Q206	2211705 or	2SD655(E) or
	2212794	2SD1468(R)
Q303,Q304	2211255 or	2SC1815(GR) or
	2210746	2SC945A(P)
Q451,Q452	2212285 or	2SC2878(A) or
	2212286	2SC2878(B)
Q501,Q502	2211371 or	2SC2259(O-001) or
	2211372	2SC2259(O-002)
Q503-Q506	2211455	2SA1015(GR)
Q507-Q510	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q511,Q512	2211353 or	2SA949(O) or
	2211354	2SA949(Y)
Q513,Q514	2211633 or	2SC2229(O) or
	2211634	2SC2229(Y)
Q732	2212294	2SK108(D)
Q733	2211255 or	2SC1815(GR) or
Q802,Q892	2210746	2SC945A(P)
Q881,Q891	2211455	2SA1015(GR)
Q903	2211353 or	2SA949(O) or
	2211354	2SA949(Y)
Q951,Q971	2211255 or	2SC1815(GR) or
Q972	2210746	2SC945A(P)
Q952	2211643 or	2SA965(O) or
	2211644	2SA965(Y)
Q953	2211792 or	2SA992(F) or
	2211793	2SA992(E)
	Diodes	
D101,D102	223132	1K60
D804	223163	1SS133
D881,D902	224151301,	05AZ13X,
D903	224651301 or	HZ13EB1 or
	224451301	MTZ13A
D891	223163	1SS133
D901	22380022	RBV402
D904	223862 or	WL01 or
	223890	W01RL
D905	223880 or	GP101N4003 or
	223896	1N4003F
D908	224153001,	05AZ30X,
	224453001 or	MTZ30A or
	224653001	HZ30EB1
D951	223163	1SS133
D971,D972	224650623,	HZ6.2EB3,
	224450623 or	MTZ6.2C or
	224150623	05AZ6.2Z
	Transformers	
L101	233401	NFIF-4072
L102	233402	NFIF-4073
L152	232139	NMIF-4062
	Coils	
L103	233383	NMC-6070 <G/W>
L104	233105	NCH-1005
L201,L202	233355A	NMC-4059
	RF block	
L151	232148	NMRF-7050
	Ceramic filters	
X101,X102	3010071	SFE10.7MA5 (RED) <D>
X101-X103	3010137	SFE10.7MMK <G/W>
X151	3010123	SFZ450JL
X152	3010076	BFU450C
	X'tal	
X731	3010141	XTL-7.2M
	Capacitors	
C001	354741009	10μF,16V,Elect.
C105	354742209	22μF,16V,Elect.
C106	354784799	0.47μF,50V,Elect.
C110	354741019	100 μF,16V,Elect.
C111	354780109	1 μF,50V,Elect.
C116	354780229	2.2 μF,50V,Elect.
C151	354780339	3.3 μF,50V,Elect.
C152	354741009	10μF,16V,Elect.
C153	354780479	4.7 μF,50V,Elect.
C154,C157	354741009	10μF,16V,Elect.
C159	354782299	0.22μF,50V,Elect.
C201	354742209	22μF,16V,Elect.
C204	354744719	470 μF,16V,Elect.
C207,C208	354741009	10μF,16V,Elect.
C209,C210	354780229	2.2 μF,50V,Elect.
C215	354782299	0.22μF,50V,Elect.
C216	354780109	1 μF,50V,Elect.
C217	354780339	3.3 μF,50V,Elect.
C218	370134714	470pF ±5%,100V,APS
C221	354784799	0.47μF,50V,Elect.
C331-C334	354780229	2.2 μF,50V,Elect.
C335-C337	354780339	3.3 μF,50V,Elect.
C501,C502	354781009	10μF,50V,Elect.
C509,C510	354722219	220 μF, 6.3V,Elect.
C529,C530	354780479	4.7 μF,50V,Elect.
C733	354721019	100 μF, 6.3V,Elect.
C737	354780479	4.7 μF,50V,Elect.
C738	354782299	0.22μF,50V,Elect.
C806	354780109	1 μF,50V,Elect.
C903,C905	335251039	0.01μF,500V,Ceramic
C906,C907	3504225	8200μF,50V,Elect.
C908,C909	354761019	100 μF,35V,Elect.
C910,C911	354744719	470 μF,16V,Elect.
C912	335251039	0.01μF,500V,Ceramic
C917	354764709	47μF,35V,Elect.
C918	354762229	2200μF,35V,Elect.
C919	354761019	100 μF,35V,Elect.
C921,C924	354741009	10μF,16V,Elect.
C922	354761019	100 μF,35V,Elect.
	Resistors	
R101	5210067	N06HR33KBD,Semi-fixed
R102	5210072	N06HR220KBD,Semi-fixed
R151	5210064	N06HR10KBD,Semi-fixed
R201	5210062	N06HR4.7KBD,Semi-fixed
R202	5210072	N06HR220KBD,Semi-fixed
R339,R340	49163105404	1Mohm ×4,1/10W,Network
R529,R530	442522704	27ohm,1/2W,Metal oxide film
R531,R532	442529104	91ohm,1/2W,Metal oxide film
R547,R548	441620474	4.7ohm,1W,Metal oxide film
R553,R554	442520104	1ohm,1/2W,Metal oxide film

POWER AMPLIFIER PC BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
R902-R905	441623614	360ohm,1W,Metal oxide film
R906	442524794	0.47ohm, 1/2W,Metal oxide film
R908	441620474	4.7ohm,1W,Metal oxide film
R909	441622204	22ohm,1W,Metal oxide film
R913	442529104	91ohm, 1/2W,Metal oxide film
	Relay	
RL501	25065339	NRL-2P5A-DC24-046
	Terminals	
P001	25060085	NTM-4PDMN29,Antenna <D>
	25060087	NTM-2PDMN31,Antenna <G/W>
P301-P303	25045213	NPJ-6PDBL-92
	Switch	
S301	25065286	NPS-22112,VCR mode
	Sockets	
P101,P102	25050270	NSCT-6P98
P402,P602	25050270	NSCT-6P98
P103	25050268	NSCT-4P96
P401	25050275	NSCT-11P103
P601	25050272	NSCT-8P100
JL406	25050269	NSCT-5P57<G/W>
	Radiator	
	27160166	

NOTE: <D>: Only 120V model
<G>: Only 220V model
<W>: Only Worldwide model

POWER AMPLIFIER PC BOARD(NAAF-3277-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q515,Q516	2211255	2SC1815(GR)
Q517,Q518	2212653 or	2SC3421(O) or
	2212654	2SC3421(Y)
Q519,Q520	2212643 or	2SA1358(O) or
	2212644	2SA1358(Y)
Q521,Q522 ☆	2201703,	2SC3855(O),
	2201704 or	2SC3855(Y) or
	2201706	2SC3855(P)
Q523,Q524 ☆	2201693,	2SA1491(O),
	2201694 or	2SA1491(Y) or
	2201696	2SA1491(P)

CAUTION: Replacement for transistor of mark ☆,if necessary, must be made from the same beta group (HFE) as the original type.

Ex. 2SC3855(O) 2SA1491(O)
Same beta group

Q601-Q604	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q605	2211792 or	2SA992(F) or
	2211793	2SA992(E)
	Diodes	
D501,D502	4000120	KB265
	Capacitors	
C603	354722219	220 μF, 6.3V,Elect.
C604	354780479	4.7 μF,50V,Elect.
	Resistors	
R533,R534	5210064	N06HR10KBD,Semi-fixed
R539,R540	442522714	270ohm,1/2W,Metal oxide film
R541,R542	441720104	1ohm,2W,Metal oxide film
R543-R546	4000080 or •	0.47ohm,5W,Metal plate
	4500022	
	Terminals	
	25060118	NTM-1S52,For leg of power transistor

PRINTED CIRCUIT BOARD-PARTS LIST

VIDEO TERMINAL PC BOARD(NAETC-3286-4/4A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q251	222840661	4066B
	Transistors	
Q252	2211455 or 2210803	2SA1015(GR) or 2SA733(P)
Q253-Q256	2211255 or 2210746	2SC1815(GR) or 2SC945A(P)
Q283	2212485, 2211255 or 2210746	JC501(Q), 2SC1815(GR) or 2SC945A(P) <D>
	Capacitors	
C251,C252	354741009	10μF,16V,Elect.
C254,C255	354724719	470 μF,6.3V,Elect.
C256	354741009	10μF,16V,Elect.
	Terminals	
P251	25045216	NPJ-4PDBL94
P282	25045172	HSJ1003-01-020

VOLUME PC BOARD(NAAF-3282-4/NAAF-3574-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q351	22240050	μPC4570C,IC
Q871	222963	LB1630,IC
C351,C352	354780229	2.2 μF,50V,Elect. capacitors
C355,C356	354721019	100 μF,6.3V, Elect. capacitors
C357,C358	354780229	2.2 μF,50V,Elect. capacitors
C394,C395	354741019	100 μF,16V,Elect. capacitors
C871	354741009	10μF,16V,Elect. capacitor
R351,R352	5104234	N16RGM50KA30F,Variable resistor,Volume <D>
R351,R352 R431,R432	5144009C	N16RGL50KA50KB30F, Variable resistor, Volume <G/W>
P351	2000635A	NSAS-4P591,Socket
JL403	25050270	NSCT-6P98,Socket
JL104	25050267	NSCT-3P95, Socket <G/W>

VOLUME INDICATOR PC BOARD(NADIS-3285-4/NADIS-3575-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D871	225241 or 225242	SEL2210R-C or SEL2210R-D,LED
	27190545	Holder,LED

CONST. VOLTAGE CIRCUIT PC BOARD(NAETC-3280-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q901	222780125NEC	78M12HF,IC
Q902	222780055NEC	78M05HF,IC
D907	223163	1SS133,Diode

SWITCH PC BOARD(NAAF-3284-4)

CIRCUIT NO.	PART NO.	DESCRIPTION
R407,R408	6182005	N25LGL200KRD10Z,Variable resistor

EQUALIZER AMPLIFIER PC BOARD(NAAF-3054-2/3)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q071	22240191 or 222570	NJM4565DD or NJM4560DX
	Elect. capacitors	
C071,C072	354780229	2.2 μF,50V
C077,C078	354721019	100 μF,6.3V
C083,C084	354780229	2.2 μF,50V
C085,C086	354742219	220 μF,16V
	Plug	
P071	25055334	NPLG-9P317

POWER SUPPLY CIRCUIT PC BOARD(NAPS-3287-4/4A/4B)

CIRCUIT NO.	PART NO.	DESCRIPTION
C901,C902	3500065A	⚠ DE7150FZ103PAC400V/125V, Capacitor IS
R901	431523355	⚠ 3.3Mohm,1/2W,Solid resistor <D>
S902	25035550	⚠ NPS-111-L512P,Power
RL901	25065269	⚠ NRL-1P5A-DC12-36,Relay <D>
	25065248	⚠ NRL-1P15A-DC12-29,Relay <G/W>
F901a	250113	⚠ SN5051,Fuseholders <D/W>
F901	252050	⚠ 5A(ST-6),Primary fuse <D/W>
F902a	25050065	⚠ YSH-403T,Fuseholders <G/W>
F902	252075	⚠ 2.5A-SE-EAK,Primary fuse <G/W>
F903a	25050065	⚠ YSH-403T,Fuseholders <G>
F903	252075	⚠ 2.5A-SE-EAK,Fuse for AC outlet <G>
	29360626-1	⚠ Label, fuse <D>

NOTE: <D>: Only 120V model
<G>: Only 220V model
<W>:Only Worldwide model

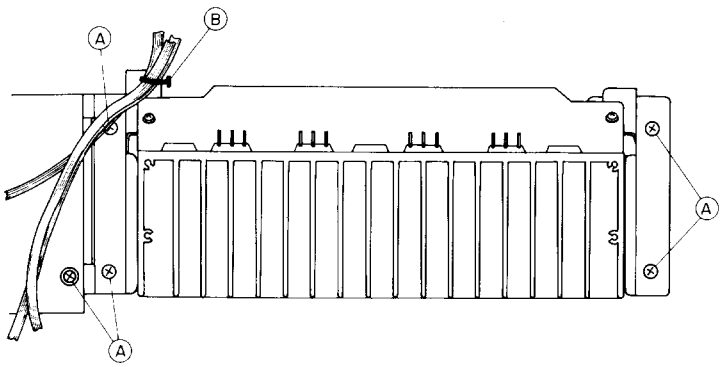
NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

DISASSEMBLING PROCEDURES

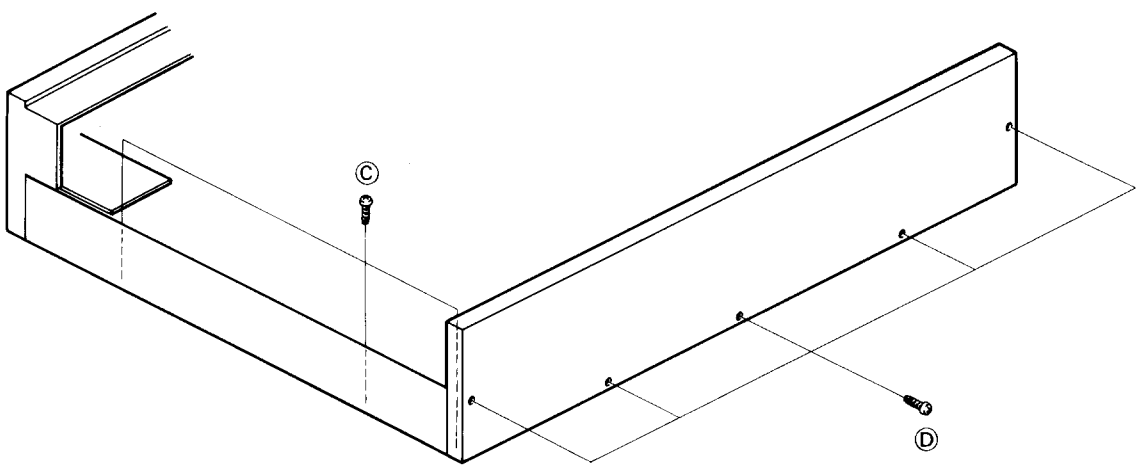
1. Top cover
Remove a screw (3TTS+8BQ(BC)) holding the top cover and the back panel.
Remove the four screws (3TTS+8B(BC)) holding the back panel and the chassis.

2. Front panel
Remove the top cover.
Remove the six screws (3TTP+8P(BC)) holding the front panel and the front backet.

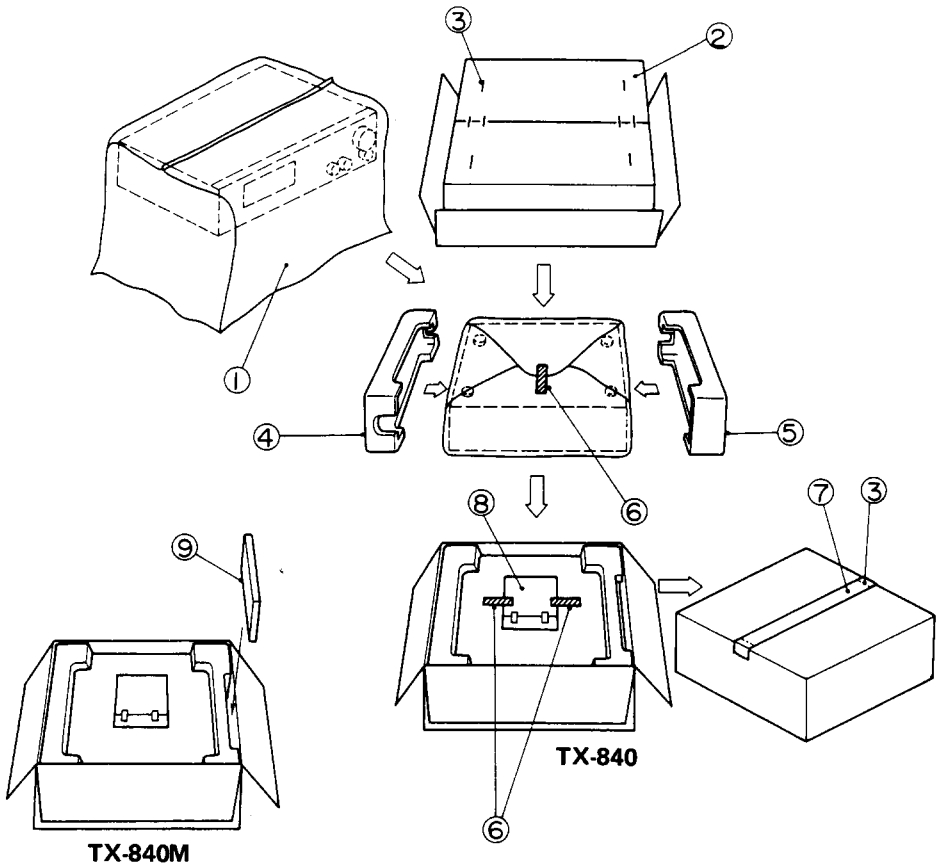
3. Power amplifier pc board
Remove the top cover.
Remove the five screws A.
Cut the binder B.



4. FM/AM tuner and selector switch pc board
Remove the top cover.
Remove the three screws C holding the pc board and chassis.
Remove the five screws D holding the back panel and chassis.
Remove the pc board from the two holders.



PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29100034	850×650mm,Poly-vinyl bag
2	29051914	Master carton box (TX-840)
	29051917	Master carton box (TX-840M)
3	282320	Sealing hook
4	29091263A	Pad R
5	29091262A	Pad L
6	261504	Adhesive tape
7	29110046	Damplon tape
8	Accessary bag ass'y	
	-120V model-	
	29341409	Instruction manual
	292064B	FM antenna
	232140	NMA-3057,AM loop antenna
	2010169	Connection cord for RI
	3010054	UM-3,Two batteries (TX-840) UM-3,Four batteries (TX-840M)
	24140151	RC-151S,Remote control transmitter (TX-840)
	29100097	250×350mm,Poly-vinyl bag
	29365019	Warranty card (U.S.A. model)
	29358002G	Service station list (U.S.A. model)
	-220V/240V models-	
	29341411	Instruction manual
	292092	FM antenna
	232140	NMA-3057,AM loop antenna
	2010169	Connection cord for RI
	3010124	UM-4,Two batteries
	24140149	RC-149S,Remote control transmitter
	29100097	250×350mm,Poly-vinyl bag
	25060123	FM adaptor (240V model)
	-Worldwide model-	
	29341411	Instruction manual
	292092	FM antenna
	232140	NMA-3057,AM loop antenna
	2010169	Connection cord for RI
	3010124	UM-4,Two batteries
	24140149	RC-149S,Remote control transmitter
	29100097	250×350mm,Poly-vinyl bag
	25060123	FM adaptor
	25055018	CV-K-1,Conversion plug
9	24140035	RC-AV20,Remote control transmitter (TX-840M)
	29341378	Instruction manual for remote control transmitter (Refer to the service manual of RC-AV20M)

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